

REMARKS

The Office Action dated October 20, 2005 has been received and carefully noted. The above amendments to claims 1, 9, and 17, and the following remarks, are submitted as a full and complete response thereto.

Support for the claim amendments may be found at least on page 6, paragraph [0020], to page 7, paragraph [0023]. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-17 stand rejected and pending and under consideration.

REJECTION UNDER 35 U.S.C. § 102:

In the Office Action, at page 2, claims 1, 2, 4-10, and 12-17 were rejected under 35 U.S.C. § 102 as being anticipated by U. S. Application No. 2004/0174199 to Simon ("Simon"). The Office Action took the position that Simon describes all the recitations of independent claims 1, 9, and 17 and related dependent claims. It is respectfully asserted that, for at least the reasons provided herein below, Simon fails to teach or suggest the recitations of the pending claims. Reconsideration is requested.

Independent claim 1, upon which claims 2-8 are dependent, recites a method receiving data, performing quadrature amplitude modulation on the data and outputting quadrature outputs, adjusting a DC offset at a digital domain of the quadrature outputs and generating a digital signal, converting the digital signal to an input current using a digital to analog converter, mirroring the input current, converting the received input

current to a voltage, filtering the voltage, and converting the filtered voltage into an output current using the mirrored input current.

Independent claim 9, upon which claims 10-16 are dependent, recites a system a modulator configured to receive data, to perform quadrature amplitude modulation on the data, and to output quadrature outputs, a DC offset adjustment engine configured to adjust a DC offset at a digital domain of the quadrature outputs and generating a digital signal, a digital to analog converter configured to convert the digital signal to an input current, a current mirror configured to mirror the input current. The system also includes a first MOSFET configured to convert the received input current to a voltage, a filter, communicatively coupled to the first MOSFET, configured to filter the voltage, and a second MOSFET, communicatively coupled to the filter and the current mirror, configured to convert the filtered voltage into an output current using the mirrored input current.

Claim 17 recites a system including means for receiving data, means for performing quadrature amplitude modulation on the data and outputting quadrature outputs, means for adjusting a DC offset at a digital domain of the quadrature outputs and generating a digital signal, means for converting the digital signal to an input current using a digital to analog converter, and means for receiving the input current from a digital to analog converter. The system also includes means for mirroring the input current, means for converting the received input current to a voltage, means for filtering

the voltage, and means for converting the filtered voltage into an output current using the mirrored input current.

Simon relates to a multiplier circuit for the multiplication of two input signals. Referring to Figure 3 of Simon, a multiplier circuit with voltage/current conversion is shown using operational amplifiers for voltage/current conversion and the rest of the circuit with MOS field-effect transistors. In current mirror branches 11 to 14 an RC element, such as a low pass filter, is interposed between input current mirror transistors 11 and 13, and output current mirror transistors 12 and 14, with a series resistor 28 and a capacitance 30 connected downstream of resistor 28 with respect to reference potential terminal 17. A common load terminal node of transistors 28, 30, 27 and 29 on the reference potential side is connected via respective current mirrors 32, 33, 34 and 35 to a respective terminal for feeding in reference currents 36 and 37. The further load terminals of the operational amplifier input transistors 28, 30, 29 and 31 on the supply potential side are connected to one another and to a supply voltage terminal 25. Additional low pass filters 29 and 30 in the current mirrors 11, 12, 13 and 14 lead to a further improvement of the noise properties of the multiplier circuit.

Applicant submits that Simon fails to disclose or suggest all the features of the presently pending claims.

Simon is devoid of any teaching or suggestion describing, “performing quadrature amplitude modulation on the data and outputting quadrature outputs; adjusting a DC offset at a digital domain of the quadrature outputs and generating a digital signal;

converting the digital signal to an input current using a digital to analog converter,” as recited in independent claim 1. Instead, Simon simply provides in FIGS. 1-3 a configuration in which operational amplifiers 20, 21 for voltage/current conversion are used in combination with current mirror branches 11 to 14 and RC elements 29, 30. However, in order to multiply the two input signals, Simon does not provide the novel steps performed to data received to generate of an output current that is substantially less sensitive to process, voltage and temperature than conventional output signals.

Because independent claims 9 and 17 include similar claim features as those recited in independent claim 1, although of different scope, and because the Office Action refers to similar portions of the cited references to reject independent claims 9 and 17, the arguments presented above supporting the patentability of independent claim 1 are incorporated herein to support the patentability of independent claims 9 and 17.

With regard to the dependent claims, applicant submits that they include the patentable features of the independent claims, and also recite additional patentable features. Thus, applicant respectfully submits that Simon fails to disclose or suggest all the features of claims 1-17. Applicant respectfully requests that the anticipation and the obviousness rejections be withdrawn.

Applicant further submits that each of claims 1-17 recite subject matter that is neither disclosed nor suggested by the cited reference. Applicant therefore respectfully requests that all of claims 1-17 be allowed, and this application passed to issue.

REJECTION UNDER 35 U.S.C. § 103:

In the Office Action, at page 3, claims 1-17 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Application No. 2003/0146780 to Chiba et al. ("Chiba") in view of Simon. The Office Action took the position that Chiba and Simon disclose all the aspects of independent claims 1, 9, and 17. The rejection is traversed and reconsideration is requested.

As will be discussed below, Chiba and Simon fail to disclose or suggest the elements of any of the presently pending claims.

The description and arguments supporting the patentability of the claims in view of Simon presented above are incorporated herein. Referring to Chiba, this reference generally describes a phase combining circuit configured as a differential amplifier with three transistor stages, i.e., load transistors 131 and 132, signal input transistors 133 and 134, and a current source transistor 136(135), stacked on top of another. However, Chiba does not cure the deficiencies of Simon. Similarly to Simon, Chiba is silent as to teaching or suggesting, "performing quadrature amplitude modulation on the data and outputting quadrature outputs; adjusting a DC offset at a digital domain of the quadrature outputs and generating a digital signal; converting the digital signal to an input current using a digital to analog converter," as recited in independent claim 1. Thus, a combination of the cited references would not provide for all the recitations of independent claim 1.

Because independent claims 9 and 17 include similar claim features as those recited in independent claim 1, although of different scope, and because the Office Action refers to similar portions of the cited references to reject independent claims 9 and 17, the arguments presented above supporting the patentability of independent claim 1 are incorporated herein to support the patentability of independent claims 9 and 17.

With regard to the dependent claims, applicant submits that they include the patentable features of the independent claims, and also recite additional patentable features. Thus, applicant respectfully submits that Simon fails to disclose or suggest all the features of claims 1-17. Applicant respectfully requests that the anticipation and the obviousness rejections be withdrawn.

Applicant further submits that each of claims 1-17 recite subject matter that is neither disclosed nor suggested by the cited reference. Applicant therefore respectfully requests that all of claims 1-17 be allowed, and this application passed to issue.

In the Office Action, at page 4, claims 3 and 11 were rejected under 35 U.S.C. § 103 as being unpatentable over Simon. The Office Action took the position that it is notoriously well known in the art that a higher order, the better the filter performs.. The rejection is traversed and reconsideration is requested.

Dependent claim 3 and 11 depend from independent claims 1 and 9, respectively, and recite the additional features of “wherein the low pass filter includes a third order RC filter.” Because Simon must teach all the recitations of the base claim and any

intervening claims of dependent claims 3 and 11, the arguments presented above supporting the patentability of independent claims 1 and 9 over Simon are incorporated herein.

Applicant therefore respectfully requests that independent claims 1 and 9 and related dependent claims 3 and 11 be allowed, and this application passed to issue.

CONCLUSION:


In view of the above, Applicant respectfully submits that the claimed invention recites subject matter which is neither disclosed nor suggested in the cited prior art. Applicant further submits that the subject matter is more than sufficient to render the claimed invention unobvious to a person of skill in the art. Applicant therefore respectfully requests that each of claims 1-17 be found allowable and that this application pass to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the Applicant respectfully petitions for an appropriate extension of time.

Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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